

ABSTRACT

A navigation and airport control and management method and system for aircraft and surface vehicles. The system incorporates the use of differential GPS to provide increased accuracy and robustness for aircraft and vehicles using GPS as the primary terminal area navigation system. An antenna is precisely located and identified with GPS compatible coordinate references. GPS signals are received with the antenna and supplied to a differential GPS base station. The base station calculates pseudorange and delta range corrections for each tracked satellite. Calculated differential corrections are then broadcast to vehicles in the local area using a radio transmitter. Vehicles receive the broadcast differential corrections and calculate differentially corrected position, velocity and time (PVT) information. This information is used on aboard the vehicle for navigational or automatic dependent surveillance purposes. At an airport control and management system ADS broadcasts are received and used for control purposes.

The construction of precise digital maps compatible with GPS is used for vehicle onboard navigation and for air traffic control situation display purposes. The digital maps include airport features such as runways, taxiways, gate areas, geographical features nearby the airport and other pieces of useful information.